

Accelerometer Has One Moving Part

A simple but precise and low-cost accelerometer — with essentially only one moving part and with continuous reading, digital output — has been invented by Dale Koehler (DMTS) of Crystal Components Division 2534. It represents a new generation in such devices, which play a key role in nuclear weapons applications. And it's potentially valuable in civilian avionics and in other types of navigation instruments.

The device is tiny; it fits in a package measuring about three-quarters of an inch long, a quarter inch wide, and a sixteenth of an inch thick. Two parallel strips of quartz are cantilevered from the base — like high and low diving boards from poolside — with spacers at base and tip (see the sketch). The thickness of the quartz strips and the separation between them are each only about five mils (thousandths of an inch). On the tip end, the spacer separating the two strips is comparatively heavy — enough that it deflects the quartz strips (that is, it pushes against one quartz strip and pulls on the other) when the device is attached to any object that's accelerating.

The quartz strips are wired to an electronic circuit that causes the strips to resonate, or vibrate, at a given frequency.

"A quartz resonator structure like this creates vibration frequencies that sense the stress in the [quartz] crystals," explains Dale. "It works much like a violin string, which resonates with a frequency that depends on the tension in the string. In the same way, if you push or pull on the end of this tuning fork resonator you cause a frequency change."

"The design is compact because we're using very small double-ended tuning fork resonators like those that keep the time in quartz watches. They're batch processed, so construction is very economical. The

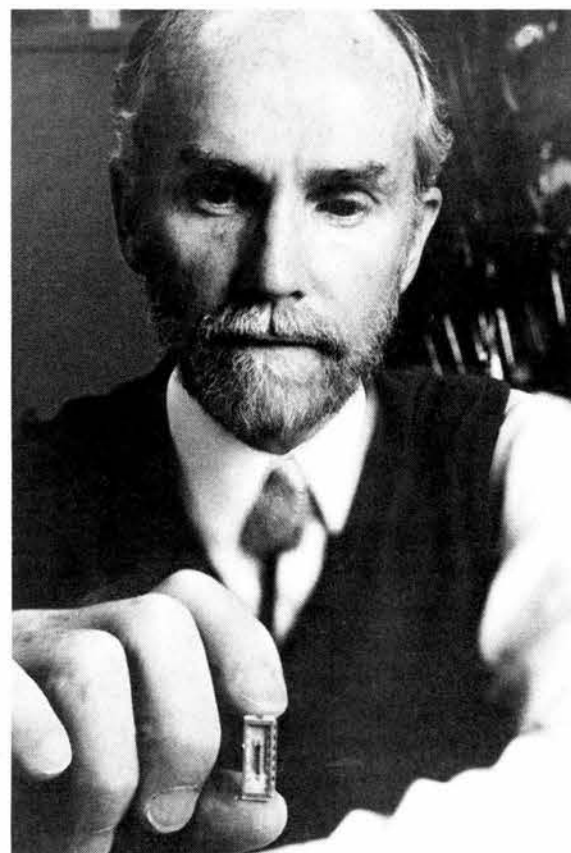
accelerometer also draws little power, and it can withstand radiation because we're using high-purity quartz and digital circuitry."

When attached to an accelerating object, the weight of the spacer deflects the strips in proportion to the object's acceleration: the greater the acceleration, the greater the deflection. The beam member being pulled goes into tension, the one being pushed into compression. In other words, the frequency of one resonator increases and that of the other resonator decreases. Outputs from the two are mixed to produce the difference frequency, which varies with acceleration.

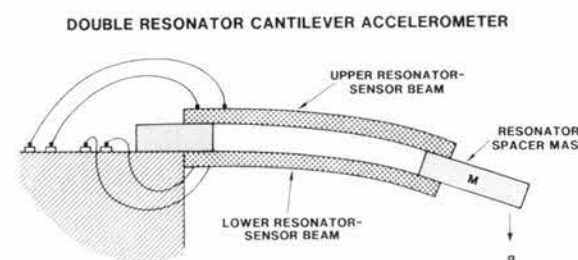
The mixed output is at the difference in frequency of the two signals. "This signal varies with the acceleration, but at twice the normal response of the individual resonators," explains Dale. "That's because as the frequency of the resonator being stretched goes up, the frequency of the one being compressed goes down. This doubles the sensitivity of the device."

A major advantage of the new accelerometer is that its resonator structure allows digital output. That in turn makes information processing easier than with the analog data from the more common acceleration sensing devices. Typically, a continuous 500 Hz reference signal might represent a state of no acceleration, a 501

(Continued on Page Six)



NEW ACCELEROMETER recently received a patent in the name of Dale Koehler (DMTS; 2534). The compact device has only one moving part, a double-ended tuning fork resonator.



LAB NEWS

VOL. 37 NO. 2

SANDIA NATIONAL LABORATORIES

FEBRUARY 1, 1985

A Chip That Sniffs

New Material Improves Surface Acoustic Wave Sensor

Devices that detect gases, including water vapors, and determine their type and quantity have been around for some time. But, for the first time, such a device has been built with a new and promising material as the sensing layer — zinc oxide. And it was built on a silicon chip, using the standard (and therefore relatively inexpensive and simple) method for constructing chips — photolithography. Steve Martin of Microsensor Division 1142 and Ken Schweizer of Physical Chemistry and Mechanical Properties of Polymers Division 1812 are the developers.

So why would one want to develop a sensor chip that can, in a sense, "smell" air-borne substances? "One possible application would be to design the device into integrated circuits to detect humidity," says Steve. "That's important. Humidity leads to corrosion, and corrosion causes electronic failure. A warning signal triggered by the sensor would indicate that humidity may have decreased the circuit's reliability."

The sensor is a new version of a surface

acoustic wave (SAW) device. It consists of a thin three-layer sandwich with zinc oxide on top, aluminum in the center, and silicon dioxide on the bottom, next to the silicon substrate.

When an acoustic wave, or signal, is generated along the top surface, it's reflected by a series of grooves etched in the zinc oxide layer. That is, each groove acts as a kind of echo-producer that sends a portion of the signal back across the top of the device to the grooves on the other side, then back again. This back-and-forth motion of the confined wave enhances the outgoing signal, an entirely predictable one.

But the wave motion is slowed if gas molecules are adsorbed by — get stuck on the surface of — the zinc oxide layer; such almost instantaneous adsorption is likely if there's a gas present, for the molecules are attracted to the zinc oxide surface.

So, by measuring the amount of impedance — the slowing of the echoing movement — it's possible to ascertain how much a collection of molecules weighs; that in turn allows determination of gas species

with a sensitivity that's considerably greater than that of bulk crystal sensors.

"The sensor acts as a microbalance," says Ken. "It will weigh species absorbed in

(Continued on Page Six)

Credit Union Assets Top \$103 Million

A \$10 million increase in assets over 1983 was announced at the annual meeting of the Sandia Laboratory Federal Credit Union last week. Total assets are now valued at \$103,608,683. Rate of interest announced for regular share accounts is seven percent.

Marilyn Bennett Strauss and Ellen Cronin (6630) were elected to the board of directors along with Bob Luna (6321), who was reelected.

Following the meeting, the board named Joe Ruggles (3661) president. Other officers are: Bob Luna, vice-president; and Carlos Griego, Jr. (7500), secretary and treasurer.

Antojitos

Seatbelts and Civil Liberties OK, the Base is being a bit heavy-handed in its current crackdown on drivers and passengers who refuse to buckle seat belts. Given my pre-shoulder-belt-era vehicle, I expect to be hassled every time I exit or enter the Base during non-rush-hour periods. (Exactly what's to keep me from reaching down and buckling up as I'm being stopped I haven't yet figured out.) But we can't say they haven't warned us. And, actually, buckling your seat belt can easily be about as much of a habit as brushing your teeth or watching TV or any of several other not-especially-fun actions. As Jerry Jercinovic points out, the crackdown isn't going to affect, much, the many Sandians who have cultivated the seatbelt habit since they were old enough to reason.

But the underlying question is whether Americans don't have some sort of "right" to exercise poor judgment. Well, just as your right to swing your fist ends where my nose begins, so your right to drive or ride without a seatbelt ends where my safety begins. If, for example, we're involved in a vehicular free-for-all on the ice in the fog in the Canyon, I want you to be wearing a seatbelt; that way, you have some chance of recovering control of your car after someone else has rear-ended you so you can avoid sideswiping me. Conversely, if you're the person I can't avoid hitting out there and you later sue me for medical expenses, my lawyer and I are going to do everything we can to convince a judge that you don't deserve any more bucks than would cover what your expenses would have been if you'd had your seat belt buckled. It's not, then, a question of rights. It's rather a question of responsibilities: we are responsible for the consequences of our actions—and we are obligated to take reasonable precautions to avoid needlessly endangering others, if not ourselves. ●BH

* * *

Quien tal hace, que tal pague. (He who does wrong, let him pay for it.)



We've received more calls for science fair judges. If you would like to help, call Karen Shane (4-3268).

SOUTHEASTERN NEW MEXICO RE-

GIONAL SCIENCE AND ENGINEERING FAIR on the campus of New Mexico Military Institute, Roswell, Saturday, March 30, 9:30 a.m. - 2 p.m.

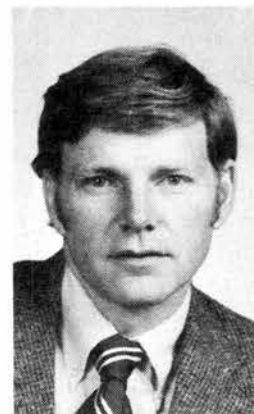
Also, these elementary schools need judges:

MANZANO DAY SCHOOL, 1801 Central Ave., NW, Thursday, February 7, 2 - 4 p.m.

SANDIA ELEMENTARY SCHOOL, north of parade ground, KAFB, Thursday, February 28, 1 - 3:30 p.m.

WHERRY ELEMENTARY SCHOOL, Gibson Gate, KAFB, Thursday, March 28, 12:30 - 3:30 p.m.

Supervisory Appointment



BOB CARLING to supervisor of Exploratory Chemistry Division I 8313, effective Jan. 16.

He joined Sandia Livermore's chemistry division in 1976 to work on the solar chemical heat pump for heating and cooling houses. He also worked on denial schemes for special nuclear materials. Next Bob transferred to the Solar Department where he was in charge of the molten salt program for the solar central receiver for two years. Other assignments included modeling mineral matter in coal combustion processes and project work on the Strategic Defense Initiative.

Bob earned his BS in biology at Olivet College (Michigan), an MS in chemistry at Oakland University (Rochester, Mich.), and his PhD in physical chemistry at the University of Michigan. He has also served as a PhD recruiter for Sandia at Iowa State.

He is active in the American Chemical Society and a director of the Calorimetry Conference. His hobbies include family camping, vegetable gardening, and wood-working. He and his wife Susan and three sons live in Livermore.

MIND OVER BODY



Stories abound about the psyche successfully overcoming disease, particularly cancer. Countless case histories depict the major role of cancer patients' positive attitude in conquering their supposedly terminal conditions. Others recount stories of people whose anger and hostility toward their disease seemingly turn inward to destroy the lesions. Though these cases offer only anecdotal evidence of the mind's power over the body, many clinicians accept it as wisdom, if not science. In an address to the Society of Surgical Oncology, Theodore Miller, surgeon emeritus at New York's Memorial Hospital, urged his colleagues to follow his example and not operate on patients who are convinced they won't survive surgery. Almost invariably, he observed, these patients die, despite a technically successful operation. (Dianne Hales in *Medical World News*)



LAB NEWS

Published Fortnightly on Fridays

SANDIA NATIONAL LABORATORIES

An Equal Opportunity Employer

ALBUQUERQUE, NEW MEXICO
LIVERMORE, CALIFORNIA
TONOPAH, NEVADA
AMARILLO, TEXAS

Sandia National Laboratories is operated by Sandia Corporation, a subsidiary of AT&T Technologies, Inc., and a prime contractor to the U.S. Department of Energy.

BRUCE HAWKINSON, Editor
DON GRAHAM, Assistant Editor
NORMA TAYLOR, Writer
LOUIS ERNE, Photographer
GERSE MARTINEZ, Assistant Photographer
BARRY SCHRADER, Livermore Reporter

Member, International
Association of Business Communicators



LIVERMORE RETIREES (left to right): Gene Lopp (8271), Bill McGuire (8444), Martha Leverenz (8161), Marv Glaze (8210), Frank Petrini (8184), and Harold "Blitz" Krieger (8479).

TRACE-2D Models Heat Flows Between Vertical Walls

Double-glazed windows, solar cavity receivers, and nuclear reactors have at least one feature in common — pairs of vertical walls facing each other with one wall at a different temperature from the other.

Researchers need to understand the problem of thermally driven flows in these rectangular enclosures so that they can estimate the heat transfer between the walls. That means they need detailed knowledge of what actually happens in the air (or other medium) enclosed by the walls.

To make that task a little less formidable, Sam Paolucci and Don Chenoweth (both 8245) have written a computer program known as TRACE-2D. The code is designed to provide insight into both laminar and turbulent flows in the presence of large temperature differences between pairs of vertical walls. Sam and Don used Sandia's powerful CRAY supercomputer along with a VAX11-730 and, finally, some color graphics terminals to visualize the flow patterns embodied in the data the project involved.

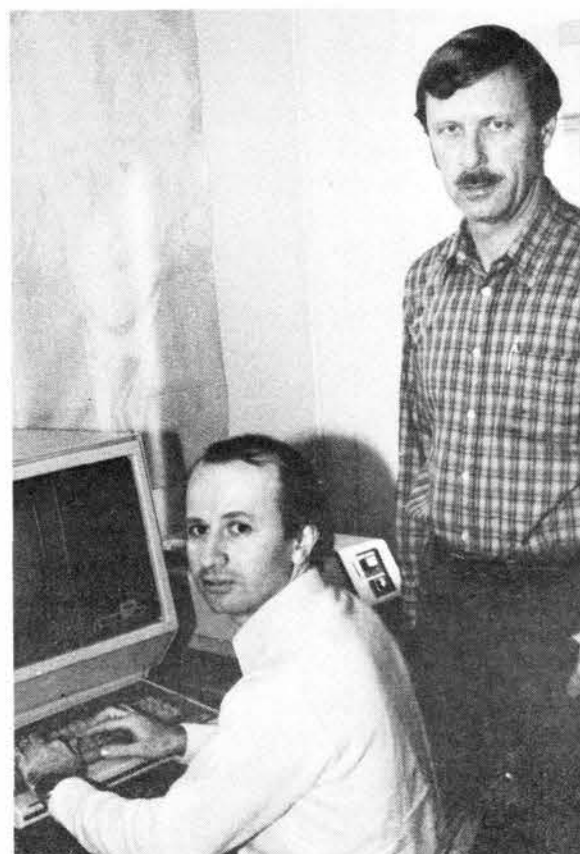
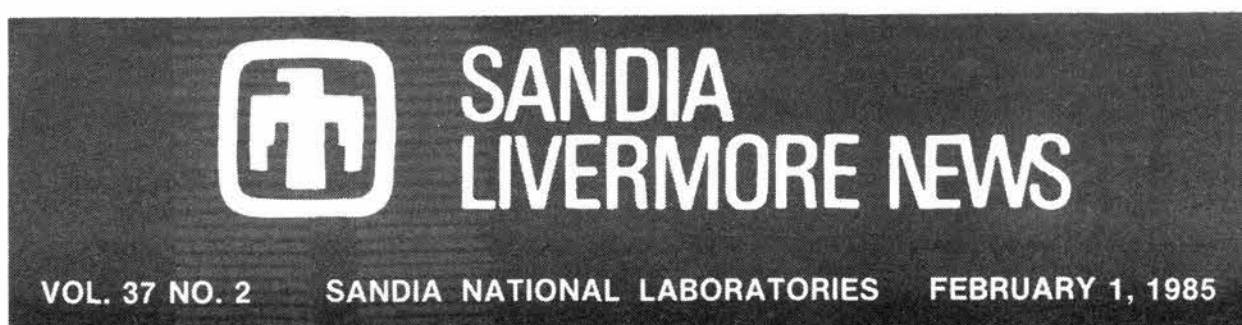
And there was an enormous amount of data: the computer was programmed to provide a solution for velocity, temperature, density, and other parameters for each grid point (intersection of grid lines) in a gigantic grid network — 123 across by 123 down — that simulates a large, differentially heated cavity. And TRACE-2D provided the results over time — from an initial stagnant constant temperature field, through a highly complex transient phase, to a statistical steady state (in which the average of the flow at any fixed point and over a certain period of time remains constant.).

To reduce the number of grid points required, and thus make a meaningful version of the problem accessible by today's computers, Sam and Don used grids of variable sizes; the largest is about 125 times larger than the smallest. And the grids move within the simulated cavity with the passage of time; that is, the grids become smaller to allow more grid points, thus more data, where the flow is especially complex; the grids become larger where the flow is weak.

For example, the steepest temperature gradients initially occur near a wall, so the grid points are concentrated there. Later in the process, the concentration of grid points might be moved to allow study of the interactions halfway between the walls.

Scientists classify fluid flows into two main regimes: 1) the laminar regime, where everything looks relatively smooth and continuous, and 2) the turbulent regime, which is more chaotic and unpredictable. Sam and Don chose to tackle both regimes to understand the effect of large temperature differences in wall-bounded convection flows. So far they have solved the easier laminar problem for a whole class of flows in an enclosure and have presented their work at several conferences.

For the same class of flows they have also solved a turbulence problem, a basically two-dimensional one, without using any empirical turbulence model. "We believe this is the first computation, even in a two-dimensional format, of the transient generation of turbulence without the use of any



WORKING AT THE TERMINAL on the TRACE-2D computer code are Sam Paolucci (seated) and Don Chenoweth (both 8245)

empirical data whatsoever," says Sam. "And we also believe our assumption of two-dimensionality is justified — there are some experiments that indicate that, for this flow configuration, the flow does behave two-dimensionally."

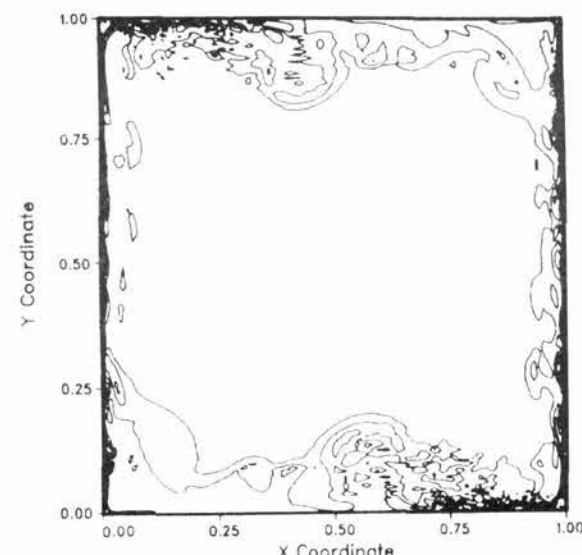
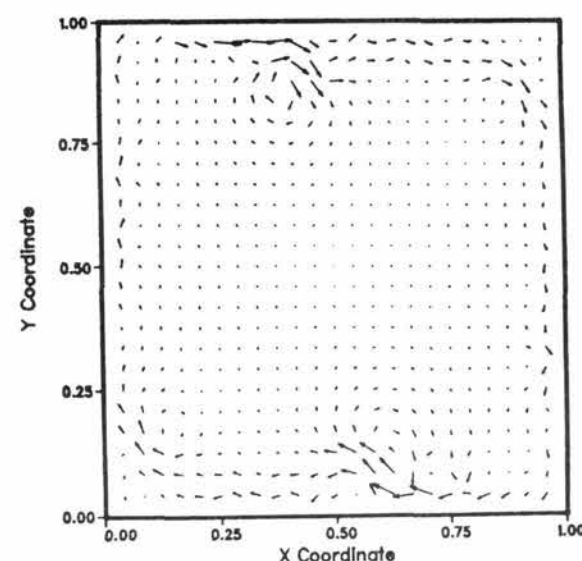
"Preliminary quantitative results also justify that assumption," Don adds. "Those results agree with published experimental data."

Sam and Don also developed a versatile interactive post-processing plotting package to make the code output useful. "The color graphics capabilities were vital because data collection from a 123-by-123 grid during various points in time means an overwhelming amount of data," Don says.

"Solving the problem required some 800,000 words of computer memory," Sam notes. "And it took 25 hours of CRAY execution time to produce the output." (See figures.)

Some of the basic results obtained from the TRACE code will benefit many researchers in fluid mechanics. It has some practical applications as well, such as predicting the heat transferred between heated and cooled sides of slots. A better understanding of what is happening inside such a cavity may allow designers to change some of the conditions to maximize or minimize the heat transfer, depending on the particular application.

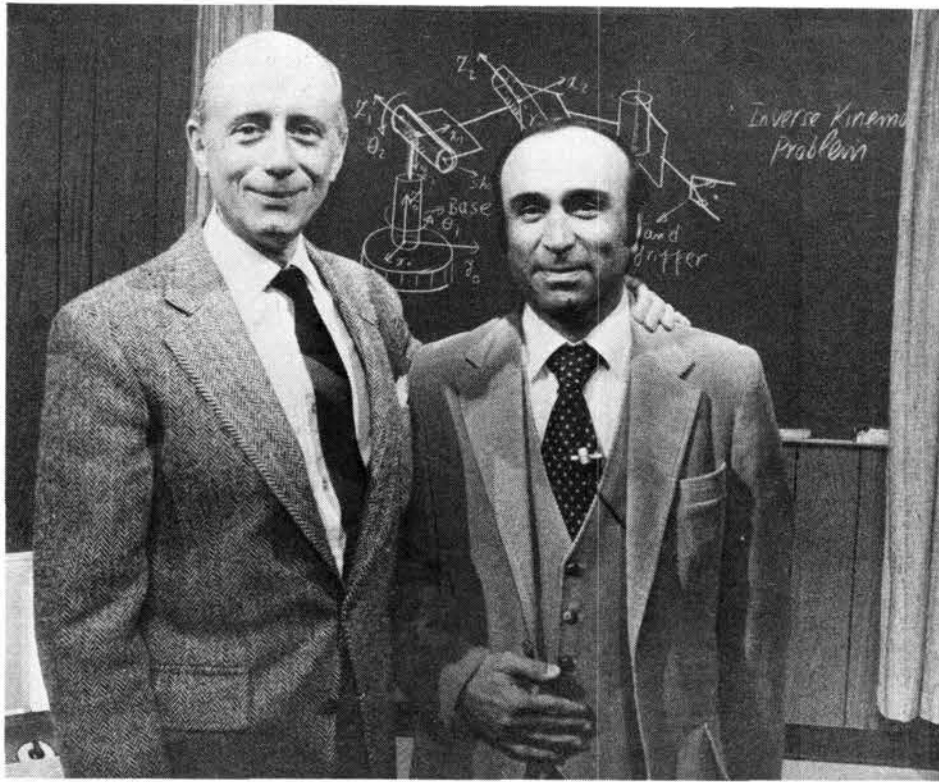
The code can also solve more general problems. For example, it has ready application in weapon programs where the problem of discharging gas from a vessel is important.



COMPUTER SIMULATION of heat flows, part of the TRACE-2D model, shows turbulence developing in the slot. Upper figure shows velocity field and lower indicates temperature contours.



NEW DIRECTOR of OMA (Office of Military Applications) for Defense Programs, Maj. Gen. George Withers, Jr., recently made his first visit to Sandia Livermore for a briefing and tour. At left is Dick Du Val, manager of the DOE San Francisco Operations Office.



IN OPENING CEREMONIES for the first two-way television classroom in New Mexico, UNM President Tom Farer (left) introduces ME department chairman Moshen Shahinpoor. Prof. Shahinpoor is teaching a robotics course to students in his classroom and in a remote classroom at Sandia.



THESE ARE THE Education and Training Division 3522 people that make the system work: Vicki Paustian, TV production assistant, monitors the equipment during class sessions; Berweida Learson, project coordinator for INTEC, serves as liaison between the instructor and the students; and Don Morrow is responsible for the technical side of the pilot project.

Two-Way System for INTEC

First 'Live' TV Course Underway

It's a first for New Mexico — a "live" video college course transmitted between UNM and 18 Sandia employees.

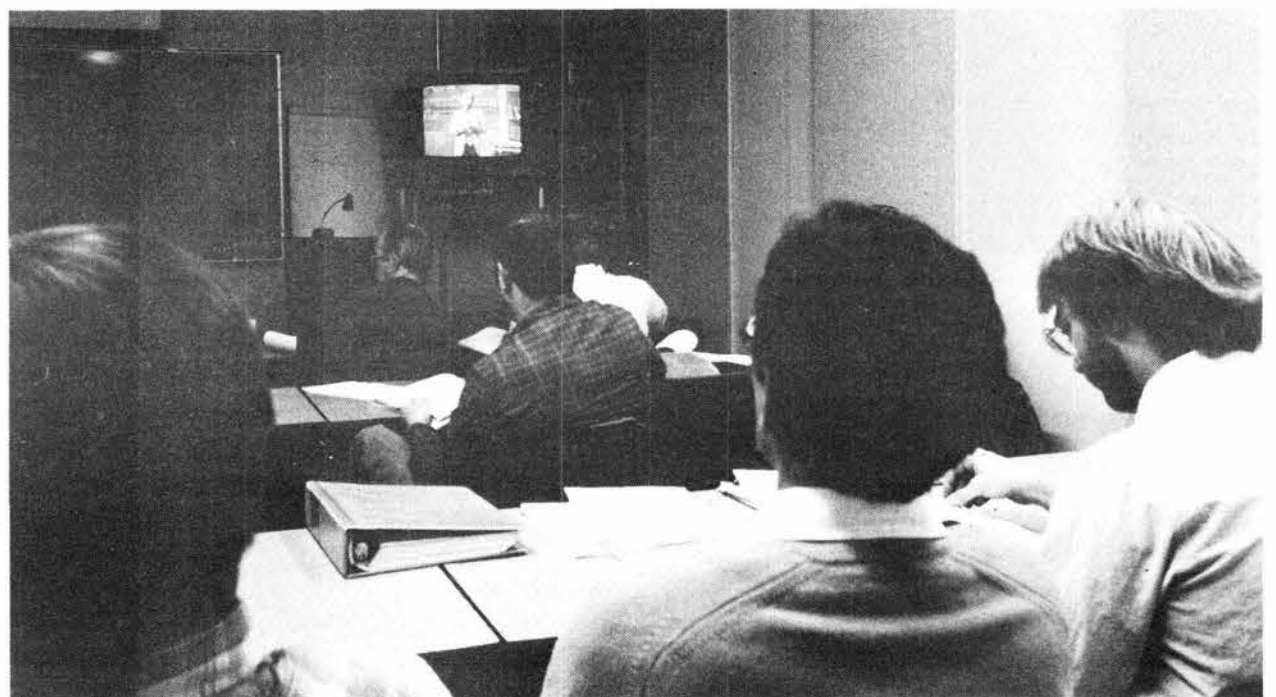
The course, "Robot Engineering," is conducted by the chairman of UNM's department of mechanical engineering, Moshen Shahinpoor. It's a senior- and graduate-level course with 30 students in the classroom at UNM and 18 students in a classroom in Bldg. 892. The two-way audio system allows the Sandia students to ask questions and have them answered by the professor as the lesson proceeds.

Berweida Learson (3522), project coordinator for In-Hours Technical Education Courses (INTEC), explains: "This is a pilot project for Sandia Albuquerque. Sandia Livermore has been providing instruction to employees directly via television for several years, but this is a first for us — a complete development effort. Our purpose in INTEC is to provide continuing education for the technical staff. The medium of 'live' video could enhance the educational offerings we make available to employees." The pilot will allow INTEC to examine the effectiveness of student learning, classroom interaction, and all that's unique about the medium as a vehicle for instruction.

The course originates at the university's instructional media center. The audio and video signals are carried by an RF cable system to the university's public broadcast station KNME TV Channel 5. It is then transmitted by microwave to an antenna atop Bldg. 802. The transmission is carried from Bldg. 802 to a classroom in Bldg. 892 by an underground fiber optic cable. Don Morrow, who handles the technical operation for Division 3522, equipped the classroom with two 26-inch color monitors for the one-way video from UNM. The instructor's audio is amplified and fed to two wall-mounted speakers. Sandia student questions are picked up by six pressure zone microphones, and fed through audio mix-

ers, amplifiers, and equalizers into a telephone line linked to UNM. Vicki Paustian (3522), TV production assistant, monitors the audio signals to ensure smooth operation at both ends.

Sandia and UNM began discussions for this joint project last August. The addition of new INTEC courses is determined by the On-Premises Education Committee (OPEC). Harry Saxton (2500), chairman of OPEC, and Stan Love (3522), worked out the agreement with Dean May of the College of Engineering at UNM. Once the agreement was reached, Don Morrow began the task of setting up the technical side. Berweida is working the instructional design effort with UNM, which includes determining course objectives, targeting the course to students' needs, and course monitoring and evaluation. The course includes a robotics lab where students will be able to practice techniques and theories learned in class.



SANDIA STUDENTS at the Bldg. 892 classroom, which is equipped with two TV monitors for the one-way video from UNM, and with six microphones for the two-way audio system.

UNM President Farer Greet First 'Remote' Class

On the occasion of INTEC's 10th anniversary (LAB NEWS, May 27, 1983), former OPEC chairman John Crawford (5100) said, "...INTEC may, someday, be involved in a Rio Grande Corridor kind of 'applied university,' with two-way live television beaming lectures and student responses back and forth among places like NM State, UNM, Los Alamos, and Sandia."

That "someday" became reality on Jan. 15 when new UNM President Tom Farer greeted students in a UNM and a remote classroom at Sandia in opening ceremonies. He expressed his thanks to Sandia's education and training staff and said that by extending the resources of the university, he hoped to bring about much closer ties with Sandia Labs.

New Foam Has Unique Qualities

A new silicone-based adhesive foam that sticks to almost any wet or dry surface, does not burn easily, and is not easily removed with typical solvents has been invented by Vern Willan (5163), Judith Mead (7213), Pete Rand (1813), and Arelio Montoya (1813).

The inventors believe it could be used for a variety of applications including neutralizing an enemy airfield during wartime.

"The basic idea of the foam is to use it to establish a series of barricades that would preclude enemy ground or flight operations for a period of time," Vern says. "This includes using it as a combination adhesive and camouflage for a number of devices that could be added to the foam — explosive munitions, locating beacons, tire-puncturing prongs, and the like."

The foam is essentially 60 percent silicone-based gel and 40 percent fluorocarbon; it also contains a small amount of carbon dioxide. Formulation begins by placing a thick, clear gel in a pressure vessel, mixing in liquid fluorocarbon, and adding carbon dioxide until the chamber is properly pressurized.

The foam can be stored under pressure in a liquid state almost indefinitely.

When the molasses-like mixture is exposed to atmospheric pressure, it foams and expands in volume about 20 times. The transformation to foam involves only physical changes — all chemical activity occurs as the ingredients are mixed.

The fluorocarbon (Freon, for example) serves two functions. First, while it is pressurized as a liquid, it acts as a solvent to achieve the desired mixture viscosity. When the mixture is released into the atmosphere, it becomes a gas that blows the gel into a foam by creating cells, or bubbles. The carbon dioxide is a nucleating agent that helps keep the foam cells relatively small and stable.

The foam can be dispersed in a number of ways. One technique is to rupture a fire extinguisher-type vessel with an explosive charge. Another is to let the liquid escape through a pressure vessel trip valve for a more controlled dispersion.

The resulting foam has a unique set of characteristics:

- It quickly wets (sticks to) many types of surfaces whether they be dry or doused with water.

- It does not burn easily; in fact, attempted burning of the foam creates a non-carbonaceous, glass-like crust that protects the rest of the material.

- It is resistant to attack and/or removal by typical solvents such as JP4 fuel, gasoline, alcohol, or toluene.

- It can be used in temperatures ranging from -50° to 100°C.

- It can be pre-mixed and stored under pressure almost indefinitely.

DOE has been issued a patent on the new foam in the names of its inventors.



INVENTORS Orie Montoya (1813), Vern Willan (5163), Pete Rand (1813), and Judith Mead (7213), demonstrate their new foam. Among other unique qualities, the foam is almost impossible to remove with conventional solvents and almost impossible to burn. It remains sticky in a temperature range from -50° to 100°C.



FOUR NEW MEMBERS were recently appointed by their vice-presidents to serve a two-year term on the Women's Program Committee; half of the members are replaced each year. The Committee, established three years ago and made up of MTS and MLS women, assists in identifying likely female candidates for employment; participates in other outreach activities — Womens' Leaders Day, career days, job fair — that encourage young women to seek careers in science and engineering; defines current EEO/AA-related concerns among Sandia women and decides on a course of action — counseling, workshops, seminars, etc.; and submits reports and recommendations to Sandia management. The members are (from left) Sharon Fletcher (7611), Gloria Padilla (7622), Kathleen McCaughey (2543), co-chair Margaret Harvey (3511), Margaret Chu (6431), Katrina Haines (5324), chair Yolanda Padilla-Vigil (3511), and Linda Branstetter (1524), not present. The new members are Sharon, Linda, and both Margarets. Women with job- or career-related concerns are encouraged to contact any member of the Committee.

Take Note

Next Tuesday, Feb. 5, voters will elect two members to the APS Board of Education and four members to the T-VI governing board. In addition, they will vote on capital improvements questions. The LAB NEWS (Bldg. 814) has a supply of brochures, published by APS, that answer questions concerning the Public School Buildings Act (enacted by the State Legislature in order to give local school districts the option of financing school capital improvement programs through a direct property tax levy rather than through bond issues).

* * *

Luke Vortman, DMTS (7111), received a Distinguished Service Award from the Division of Alternative Energy Technologies and Systems of the American Nuclear Society "in recognition of his unfailing dedication to the interest and purposes of the Division and the Society as demonstrated by his crucial contributions to the establishment of the Division; his continuing, decade long, active and outstanding participation in the Division's affairs; his especial devotion to the interests and growth of the Division's membership; and his incisive and effective representation of the Division's purposes and concerns to ANS national bodies."

* * *

Spend "A Night with Your Valentine" and benefit the Ronald McDonald House — the Albuquerque home for out-of-town families with children needing medical care. On Thursday, Feb. 14, ground will be broken for the expansion of the Ronald McDonald House. That evening the off-Broadway production "Greater Tuna" will be performed at the Wool Warehouse to kick off the fund-raising campaign for the expansion. Don Perkins, former UNM and Dallas Cowboy football star, will be master of ceremonies. Tickets, including dinner and the play, are \$30 per person with \$10.50 tax deductible, and are available from Geri Hamilton (121), 265-2797. For more information, call Patti Kuswa, 821-4883 or Mary Ann Woodward, 293-8953.

* * *

Training classes for Rio Grande Zoo Weekend Docents (volunteer teachers and guides) will begin with an introductory coffee Feb. 2 at 10:30 a.m. in the Zoo Barn, 903 Tenth St. SW. For more information, call Alice Fienning, 298-0743.

* * *

A videoconference, "Robot Dynamics and Control," will be offered Feb. 27 from 8:30 a.m. to 2:30 p.m. by UNM's Division of Continuing Education and the Albuquerque Chapter of IEEE. The seminar, for graduate engineers, will be conducted via satellite and participants will be able to interact directly with the presenters, who will examine several different strategies for accomplishing accurate robot arm control.

Registration (\$85/person; \$5 discount for IEEE members) deadline is Feb. 18. The seminar will be held at UNM. For more information call 277-3751.

* * *

Dave Hafner, Curator of Zoology at the NM Museum of Natural History, will lead "A Whale of a Weekend" trip in San Diego, Feb. 16-18. Events include a private tour of the San Diego Zoo and a full-day whale-watching cruise off the coast of San Diego. For reservations or more information, call 841-8838.

* * *

Why study math? How can you help your child with math? Who needs math? What causes math anxiety? These and other questions will be discussed at the "MATH: Math Awareness Through the Home" meetings sponsored by the three APS Area Parent Advisory Councils. The series consists of three sessions, which will be held from 7:30-9 p.m. in each of the East, North, and South Area Offices of APS as follows: South Area, Feb. 5, 19, and 28; North Area, Feb. 7, 21, and March 7; East Area, Feb. 14, 25, and March 11. For more information call Hilde Howden at 842-3731.

* * *

Content of the prints on exhibit in the Bldg. 802 foyer through Feb. 21 appears to be another "no smoking" campaign, but Jim King (7400) says there's more. The prints were made from hand-painted lantern slide originals that Jim found in an antique shop in Pierceton, Ind. They were used in 1925-35 by a professional lecturer, probably a physician, who had strong feelings about smoking being a "dirty habit" even 60 years ago.

Jim is a collector of photographic memorabilia, particularly photographs and equipment used around the turn of the century.

* * *

Retiring this month and not shown in LAB NEWS photos are Virginia Chapman (5125), Joe Cuellar (3426), James Fisher (7625), Reynaldo Gonzales (3618), Herbert Howe (1654), William Meyer (1620), Robert Randall (2441), and Fredericka Juhasz (3140).

* * *

Honorary German Larry Lopez (3151) will prepare *roladen*, (a traditional German main dish) on "Somos Bilingues" with Julia Gabaldon (3163) on Feb. 10 at 8:30 a.m. on Channel 7. The program will also feature the Edelweiss German Dancers. The media attention is merely prelude to the German-American Club's fourth annual Fasching Parade and Oktoberfest-in-February on Feb. 17. The parade starts near Carlisle and Menaul, goes east on Menaul to Quincy (where the club is located), then south to Cutler.

* * *

Sandians with daughters in grades 8 to 12 can register them for a conference, "Expanding Your Horizons," on March 2 at UNM's Woodward Hall from 8 a.m. to 3:30 p.m.. The purpose of the conference is to inform young women about opportunities in non-traditional technical careers, to motivate them by providing successful women professionals as role models, and to give them practical advice on overcoming barriers. Registration deadline is Feb. 15. For more information, call Imogene Russell, 345-9021.



NANCY PRUETT, technical information specialist in Technical Library Reference Division 3144, recently received a plaque of appreciation for two talks she presented in Lawrence, Kans., at the Kansas Geological Survey and University of Kansas. She discussed "How Geoscientists Use Information" and "The Role of Scientific Libraries and Databases in Scientific Research." She is a member of the Advisory Council for the GeoRef geological database of the American Geological Institute. Her talks were in conjunction with St. Barbara Day, patron saint of miners and those who work with explosives, observed by the Geological Survey.

Welcome

Albuquerque

Gary Ahasteen (325)
Perry Cowen (7652)
Harry Delap (7653)
James Dotson (3611)
Steven Giles (2312)
Anthony Gomez (7481)
Don Kandlbinder (7653)
Roy Leblanc (7121)
Kathleen Mahnesmith (7651)
Vicki McConnell (1845)
Mark McLean (2149)
Claudia Miller (7652)
Samuel Seiver (7121)
James Spalding (7652)

Arizona

Janet Day (2364)

District of Columbia

Timothy Renk (1261)

Illinois

Charles Lloyd (7653)
Charles Yagow (7653)

Louisiana

Jeffrey Danneels (3643)

New Mexico

Gregory Brue (1815)
Louis Kerchion (7653)
Mark Miskiel (1833)
Harold Ortiz (7651)
Lee Schanwald (1244)
Jimmy Tempel (2631)

Texas

Pablo Garcia (2364)
David Salguero (1635)

Utah

Ned Hansen (5171)

Continued from Page One

Accelerometer

Hz signal the beginning of acceleration, and a 499 Hz signal the beginning of deceleration.

The design also provides a temperature-compensated feature: the frequency-versus-temperature characteristics of the two resonators are almost identical. This means that both frequencies respond to temperature change so the temperature effect almost vanishes from the difference frequency. Temperature-caused signal fluctuations are common to traditional accelerometers.

Dale worked with tuning fork structures before he came to Sandia in 1977. He used the concept of a double-ended tuning fork (developed by former Sandian Errol Eer-Nisse in the late 70s) to design a complex resonator that could withstand high shock and vibration environments.

A U.S. patent on the device has been issued to the DOE in Dale's name. Research continues at Sandia on the basic design. "We are aiming at increasing the range of the device so it can measure acceleration from micro-Gs [millionths of a G] all the way to tens of thousands of Gs," says Dale.

(One G, or gravity, equals the acceleration due to gravity at the earth's surface; that is, 32.2 feet per second per second.)

Continued from Page One

SAW Device, the Chip That Sniffs, Developed

the surface layer with a resolution of 50 picograms — that's trillionths of a gram — per square centimeter."

Serendipitously, the device is also sensitive to those molecules that, over a somewhat longer time (a few minutes), are absorbed into the zinc oxide. "We expected some adsorption on the surface, but we didn't realize that these molecules would be absorbed — would permeate — to the extent

LANGUAGE VANQUISHES DRAGONS

In 3000 B.C. people believed that writing was magical. Thoth, the Egyptian god of learning, was said to have invented written language, and the ancient Egyptians thought that words possessed supernatural power over the objects they symbolized. Hieroglyphs were used for religious writing, and prayers meant to assure a suitable afterlife were inscribed on the tombs of kings. . . . In our despair about illiteracy, aliteracy, and the erosion of the basic skills of college students, we should not forget that the origins of language and much that we know of art were in the supernatural. To return to literacy, we may have to return to those origins. Students today have lost more than the ability to read and write; they have lost belief in the intrinsic power of language. Some may see the loss as trivial in the midst of the communications revolution swirling about us. But as important as computer literacy will be in the brave new world, special powers will always belong to those who can read and write well. But first must come a passionate desire to possess those powers. (Marie Jean Lederman in *Chronicle of Higher Education*)

that they do," says Steve. "Apparently it's the polycrystalline nature of the zinc oxide that's the secret: the molecules seem to permeate the layer by following the grain boundaries or the pores that extend through the layer."

And the permeation time — the time it takes the molecules to find "niches" in the zinc oxide — is dependent on molecule size: smaller molecules such as methanol take longer to find a niche than do larger ones such as carbon tetrachloride. This process also affects the acoustic signal because the absorbed molecules tend to load the wave and decrease its velocity across the surface.

Again, this change in signal is detectable and helps to allow determination of the kind of molecule that is being absorbed. The signal change lasts only until the zinc oxide is completely permeated by the gas molecules; that is, once each molecule has found a niche within the layer, the process ends — the zinc oxide and the gas molecules reach equilibrium.

"The equilibration time depends on molecule size," says Steve. "So the device allows us to determine both size and weight of the molecules senses. That's a big step

toward determining the precise type of gas absorbed."

Steve worked on zinc oxide SAW devices for other applications while in graduate school at Purdue and continued when he joined Sandia in 1983. In investigating the material's potential as a vapor sensor, he and Ken worked out the theory for the new sensor. The prototype devices were made at Purdue.

The entire device is produced by the standard method (photolithography) used to make integrated circuits.

"That's a big advantage of this material [polycrystalline zinc oxide]," says Bob Hughes, 1142 supervisor. "You can deposit it right on a silicon chip as a part of regular integrated circuit processing. Since it's compatible with silicon technology, you could have the detection circuit and oscillator on the same chip as the rest of the circuitry. Otherwise, you would have to include a physically separate vapor sensor, and you'd end up with a hybrid circuit."

Good Bad Writer Honored

Orman Wins Reztilup Prize

John Orman (6444) has won this year's Reztilup Prize for the best parody of the worst technical writing. The Reztilup (Pulitzer spelled backward) was created by Donna Rix (3153), a tech writer herself and the teacher of the INTEC course in the subject.

"The Contest for the Reztilup Prize in Technical Writing gently-ridicules the use of pompous, pretentious, wordy language that fails to communicate effectively," says Donna. "We hope to promote a consciousness among Sandians of the characteristics of bad engineering and scientific writing. Maybe we can't reform all the writers of overblown technical prose, but we can learn to recognize it, see through it, even laugh at it."

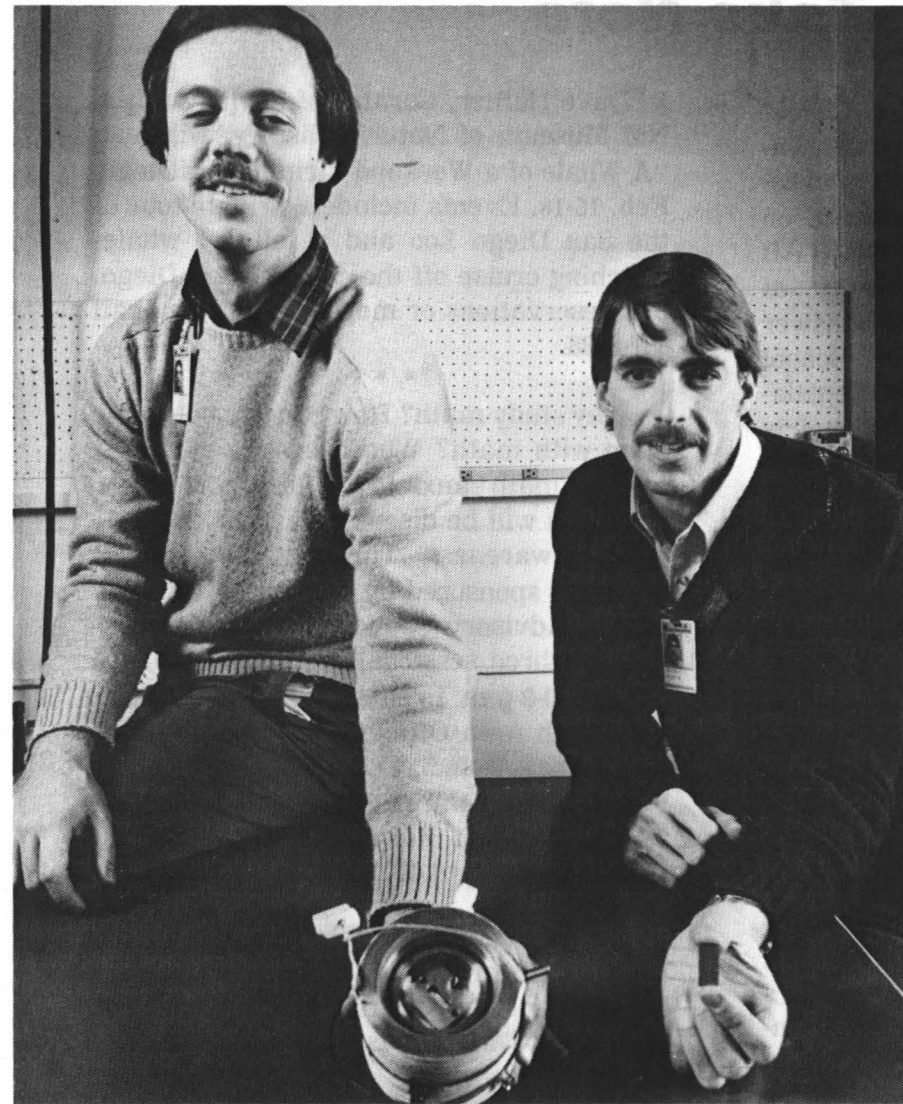
First runner-up was Beth Richards (6445), second was Ginny Eckhart (7633), and third was Fred Harper (6412). A dozen other contest entrants won dishonorable mentions. Contest judges were Hank Willis (3100), Lee Garner (3151), Ann Hogan (3436), Charles Tapp (5140), Bob Easterling (7233), and Donna.

The contest is modeled on the Bulwer-Lytton contest for bad fiction. Edward Bulwer-Lytton wrote *The Last Days of Pompeii*, coined the phrase "The pen is mightier than the sword," and immortalized "It was a dark and stormy night."

Next year's contest is now open. The bulletin boards have the particulars, or call Donna for more info. She's also looking for judges.

Winning either the Bulwer-Lytton or the Reztilup contest doesn't mean that the writer is truly bad. On the contrary, it takes considerable talent to write poorly on purpose.

And poor talent to write considerably. So we'll stop. See the box for John's winning entry.



CHIP that senses gases and vapors has been invented by Steve Martin (1142), right, who holds a case that contains the tiny device, and Ken Schweizer (1812), who holds a chamber in which the device was tested. Known as a SAW (surface acoustic wave) device, the unit can detect type and quantity as well as existence of gas concentrations.

Accelerometers: Earlier Generations, Future Promises

The accelerometer invented by Dale Koehler is the latest in a long series of such devices developed or substantially improved by Sandians.

For decades the Labs has had prime responsibility for such weapon-related tasks as safing: that is, ensuring that a nuclear device could not detonate unless it had experienced the environment — a given trajectory, for example — it was designed to operate in. That means that a weapon had to be able to tell the difference between, say, an intended drop from an airplane and an airplane crash.

Safing devices have historically utilized acceleration sensors, in particular environmental sensing devices (ESD). These devices respond to acceleration over a period of time by closing a set of switch contacts that allows the weapon to arm. (ESDs are not true accelerometers, which actually measure acceleration continuously.)

"Early ESDs worked on one of two principles," says Mike Heck, supervisor of Guidance and Control Division I 2334. "One was the short piston in a long cylinder. The force of acceleration would move the piston from one end of the cylinder to the other, generally through a thick fluid so it would take a given amount of time to travel the length of the cylinder. When it reached the other end, it would close a set of switches that would in turn allow the weapon to be armed and ready for fuzing and firing.

"The other principle uses an escape-mechanism. This means that a series of gears would be arranged to respond to acceleration by rotating back and forth through a short arc much as an

old-fashioned — pre-digital — clock's mechanism works. When a given number of acceleration-induced movements had taken place, arming would follow.

"Devices built with either principle were large and stout so they could survive crush, fire, shock — all the environments they would see if the plane carrying a device crashed. And they were expensive to fabricate — tolerances had to be tight."

The next generation was rolamite, invented by Don Wilkes, a former Sandian. The principle here was entirely new: two rollers are held between the loops of a flexible S-shaped band; the ends of the band are attached to a frame. The rollers can be made to "prefer" a certain position within the band by tapering the band or by cutouts within the band, which weaken it selectively.

"In a single-level acceleration switch, the rollers are held in place by a triangular cutout until vehicle acceleration reaches a certain level," noted the Oct. 20, 1967, LAB NEWS. "Once this 'break-away level' is achieved, the roller cluster very quickly snaps to the other extreme position, closing a circuit and signaling achievement of the desired acceleration."

The advantage of rolamite is that the device is nearly frictionless — the same surface areas of the roller and the band always meet so there's no sliding. A rolamite device is also simpler, and therefore less expensive, to build than earlier ESDs. Several current weapon systems use rolamite devices for acceleration sensors and for other functions.

"Over the next decade or so, Sandia

was successful in developing very small — and integrated — arming, fuzing, and firing devices," says Mike. "We kept looking for ways to build in greater accuracy. That meant we've continued to develop real — that is, continuous output — accelerometers."

"It's too early yet to foresee exactly how the new accelerometer developed by Dale will be used in a weapon system," Mike continues. "But, although it's an 'open loop' device — as opposed to the closed loop devices now common — Dale has a nifty way to convert deflections to a digital readout and get very high precision. In addition, it features continuous readout, small size, and low cost."

"It's being considered for several weapon systems that are now in Phase 1 or Phase 2," says Tom Young, supervisor of Crystal Components Division 2534. "It may well play a role in nuclear safety systems. And it has potential for application on some non-nuclear weapons in the future."

"We can also foresee potential uses in other Sandia programs, for example, in navigational devices, in borehole logging, and so forth. And engineers outside Sandia may well discover many applications we haven't even thought of — one can imagine many things."

Mike agrees: "I think there's an excellent chance that such devices will be used on 'smart weapons' of the future — and perhaps on robots, maybe even in medical applications where there's a need for an orientation-sensing ability for a person with impaired balance or for a paraplegic who needs a remotely controllable artificial limb."

Reztilup Prize-Winning Entry

Milestone Overturned

by John Orman (6444)

A large milestone was thrown in the direction of terminally completing a reportage on the definition of the expectational release of various and/or sundry materials that are active radio-wise. The guesstimation of the liberating release to the surrounding ecological environment in the eventuation of a severe-like light water reactor accident occurrence was foundationally based on the addition of a special module to enhance the START computer code. Thusly speaking, this module may well be cognitized as an "aid-of-the-START" model.

Programmatically part-wise, Sandia has been tasked to delimitize the magnitude of typically common source term uncertainties ascribable to the topically current incomplete understanding of accidental mistakes that are severely phenomenal.

The Quantitative Uncertainty in Aerosol Condensation Knowledge (QUACK) committee was expertised by gaseous expert A. Rowe Saul. The QUACK team would not duck their responsibility by winging it, so (without ravenously crowing mallard-dictions) they carved their initials in the milestone upon the finalized completion of a drafty 512-page report paper and a 486-page summarology on the indefinite uncertainty in the possible potentiality of radionuclide release from the FUBAR plant in Snafu, NY. A TILT accident scenario-type was

presumably assumed. Creating copious amounts of waste, the QUACK team resolutioned that reactor disasters are dangerous.

The QUACK statistical analysis was regressioned through the use of the COINFLIP formulae given in the well-known but poorly understood Handbook of Appalled Mathematical Fictions. The uncertainties are foundationed on the variational spread in experimental test data results and on forecast predictions of differing fashion models.

The definite span of indefiniteness in the size of the amount of aerosol radioactivity not-unsuspended is very timeliness-dependent and generally borderlines on the estimated order of approximately about a factor of roughly 67.373 Ball Parks (BPs). All stages of the accident importantly contribute significantly serious substantiality to the uncertainty of 99.99 percent, give or take a standard deviate that might have fallen through the QUACK's analysis. Despite the surely certain indisputability of the true fact that the uncertainty bottomlines are largely big, the immensity of the amount of suspensefully aerosolized radioactivation for most of the irrelevant cases considered diminishingly decreases by a matter of factor of two within a clocktiming of three hours (180, minute-wise) from the happenstance of vessel failure deficiency.

Armand Hammer Art Show Set Through April 7

Anyone who made reservations to view the Armand Hammer Collection at the Albuquerque Museum before Feb. 22 will not see the paintings by American artists. Those paintings have been on exhibit at the National Gallery of Art in Washington, D.C., in honor of the presidential inauguration, but will join the collection on Feb. 22. The Museum has reserved space for the eight works to hang together so that visitors who have reserved time early to view the whole collection will be able to return to see this special group. Because of the delay in receiving these paintings, the exhibition has been extended to April 7. Those who have reserved tickets early in the exhibit and who want to see the American paintings can call and reserve additional time to view them.

So that the public will be able to view the collection without crowding, the Museum is issuing 125 tickets for every 30 minutes during Museum hours. The tickets are free and will be dated and the entry time designated; they will be held at the Museum in the name of those making the reservation until 30 minutes before entry time. Tickets may be reserved for up to four people under one name. Call the Museum at 766-4905, 4906, 4907, or 4908 for reservations (have a time and date in mind when you call).

Museum hours have been modified for this show. On Tuesdays, Thursdays, and Saturdays the Museum will be open from 10 a.m. until 5 p.m.; on Wednesdays and Fridays from 10 a.m. until 9 p.m.; and on Sundays, from 1 p.m. until 5 p.m. The Museum is located at 2000 Mountain Road NW.

Events Calendar

Feb. 1 — KiMo Guitar Series: James Emery and the String Trio of NY, contemporary ballads and jazz, 8 p.m., KiMo.

Feb. 3 — The Best of Broadway and International Theater: "The Magic of David Copperfield"; *Feb. 11* — Hubbard Street Dance Co., modern dance company from Chicago; 8:15 p.m., Popejoy.

Feb. 6-17 — NM Repertory Theatre, "A Streetcar Named Desire," Wed. - Sat. 8 p.m., Sat. & Sun. 2 p.m., KiMo, 243-4500.

Feb. 8-9 — NM Symphony Orchestra, Eliot Fisk, guest guitarist; 8:15 p.m., Popejoy.

Feb. 10 — Show Time — Big Band Cavalcade: Alvino Rey, The King Sisters, Fran Warren, and John Gray; 8 p.m., KiMo.

Feb. 11 — "A Naturalist's Tour of India," lecture and slides, 7 p.m., KiMo.

Feb. 12 — Animal Humane Assoc. Benefit: Hollywood's Richard Blackwell with 40 of his latest fashions — fashion show and luncheon; for more info: 255-5523.



CARL PENNINGTON (7471-1) and DICK CURLEE (7471-2)

Supervisory Appointments

CARL PENNINGTON to supervisor of Glass Formulation and Fabrication Section 7471-1, effective Dec. 21.

Carl joined Sandia's mail and messenger center in September 1965. A year later he moved to the janitorial organization where he worked for five years while attending UNM. He's been with the glass lab since 1971 until 10 months ago when he transferred to Mechanical Process Engineering Division 7484.

Carl received his BS and MS in industrial education from UNM. He enjoys basketball and handyman projects, but says that with six cars in the family, he's had to develop certain mechanical skills; he also plays the guitar. He and his wife Carmen have four children and live in the SE heights.

DICK CURLEE to supervisor of Physical Electronics Section 7471-2, effective Dec. 21.

Joining the Labs as a technician in March 1960, Dick worked for 12 years in the materials development organization on electronic packaging, polymer materials development, and flight materials in AF programs. He then moved into energy related work on oil shale, coal liquefaction, and magma. Most recently he's worked with safeguards engineering in Project Engineering Division 5247.

Dick earned an associate degree in mechanical technology from Southern Technical Institute (Atlanta, Ga.). He enjoys camping, fishing, hunting, skiing, and traveling. Dick and his wife Kathleen live in the NE heights.

Seniors Helping Seniors

Social Security, Medicare Course Set

Seniors Helping Seniors (a non-legal advocacy service provided by the Albuquerque/Bernalillo County Office of Senior Affairs) will coordinate a UNM Continuing Education Program "Social Security, Medicare and Supplemental Insurance for Senior Citizens," during six consecutive Saturdays from 10 to 12 noon, beginning Feb. 2.

The course will cover major aspects of Social Security, Medicare, and health insurance to fill the "gaps" in Medicare benefits. It is intended for people preparing to retire, young people assisting an older relative or friend, and those on Medicare who would like more information about these programs. Eligibility for Social Security and Medicare, benefits and restrictions of the Medicare program, submitting claims, choosing a supplemental insurance policy, and the current and proposed changes in federal regulations to reduce the cost of health care will be

covered. In addition, the program will include discussions on probate rules associated with making a will and probating small estates. There will also be a discussion on resolving consumer complaints.

For more information, contact the Office of Senior Affairs, 766-7671; to register, contact UM Continuing Education, 277-6542 or 277-6543. Individuals can register for any or all of the six programs; the only charge will be a \$5 materials fee.

Sympathy

To Wayne McMurtry (7112) on the death of his daughter and son-in-law in Albuquerque, Dec. 16.

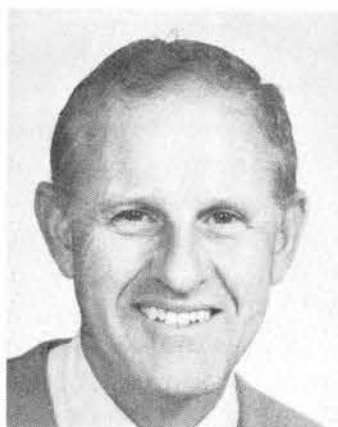
To Arlin Cooper (2612) on the recent death of his mother in Albuquerque.

To Natalie Vytlačil (2634) on the recent death of her mother in Albuquerque.

MILEPOSTS

LAB NEWS

FEBRUARY 1985



Ken Mitchell (8163) 25



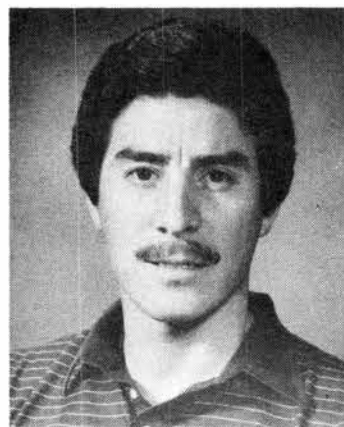
Lloyd Keller (5154) 30



Bob Banks (3531) 25



Dave Timmer (8182) 25



Phil Gallegos (7474) 10



Val Cowan (8000) 25



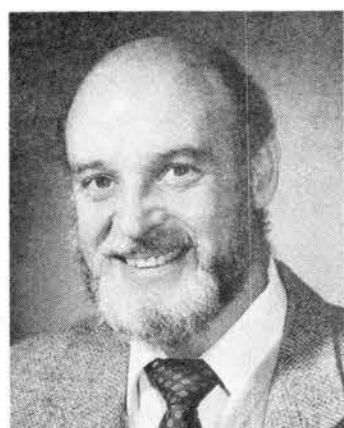
Louise Converse (8181) 25



Lynn Tyler (6332) 20



Mary Ann Reay (8236) 10



Paul Cooper (7132) 20



John Coleman (7633) 30



Bob Strout (8171) 25



Kitty Weston (5215) 30



Nancy Hunt (8265) 20



Jim Hinson (3435) 35



Dennis Benedict (3423) 30



Amado Trujillo (5245) 20

Retiring



John McKiernan (5117)



George Hosking (7262)



Cecil Page (5121)



George Cosden (3732), Gary Boyes (3721)



Bill Peay (7653)



Art Savage (3425)



Tom Morgan (3543)



Elvin (Beez) Beezley (7135)



Margo Griego (3618)

UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS

Deadline: Friday noon before week of publication unless changed by holiday. Mail to: Div. 3162.

RULES

1. Limit 20 words.
2. One ad per issue per category.
3. Submit in writing. No phone-ins.
4. Use home telephone numbers.
5. For active and retired Sandians and DOE employees.
6. No commercial ads, please.
7. No more than two insertions of same ad.
8. Include name and organization.
9. Housing listed here for sale is available for occupancy without regard to race, creed, color, or national origin.

MISCELLANEOUS

HUMIDIFIER, Wards 7-gal, variable speed/level, \$75; Eureka canister vacuum, \$15. Sharp, 293-1824.
ENCYCLOPEDIA SET, 1984 Compton, 24-volume, still in box, \$600 value, \$395. Chavez, 881-2711.
ADDING MACHINE, Smith Corona electric, Figurematic Model 708, \$15; dishes, service for 6 plus serving pieces, \$20. Allen, 296-6453.
AUTO ENGINE STAND, rotating, size adjustable, \$35. Strait, 842-1695 after 6.
WINCHESTER Model 70 30-06 with 4X scope, strap, case, \$395. Swanson, 884-8650.
GAS RANGE/OVEN, Kenmore, brown, \$200. Roller, 294-3417.
RIFLE, Anschütz 1422D; Ruger single six; Colt diamondback; 410 shotgun, 2X EER scope, shoulder holsters. Zamora, 865-0737 after 6:30.
SINGLE TUB, panel ray heater, \$10. Campbell, 888-3135.
LIVING ROOM SET: sofa, loveseat, chair, coffee table, 2 end tables, dark stained pinewood, high back cushions, \$300 (delivered \$325). Jacobs, 292-6174.

BOX SPRINGS, queen, \$50; frame, \$25; new baby walker, \$20; stone hand mill, \$45; lawn mower, \$50; bassinet, \$8. Campbell, 294-1380.
TWIN BED: mattress, box spring, frame, \$85. Escherick, 299-8393.
CAMERA, 35mm Canon FTQL SLR with 35mm, 80mm, 200mm, close-up lenses; complete darkroom, Durst enlarger, Nikon lens. Craig, 883-0004.
KITCHEN COUNTER TOP, double sink, range hood; 2 combination storm/screen doors 36"; make offer. Arnold, 294-7160.
SCREEN DOOR for sliding glass door, 36"x79 metal frame, new \$20. Burton, 869-2541.
PORTABLE AM/FM radio, AC/batt, GE model P4810A, takes 4 AA batts, \$18; heater fan, Kenmore 1600W, \$8. Rainhart, 821-3690.
LIGHT FIXTURE, Tiffany style, ceiling hung, yellow stained glass, holds 2 globes, cost \$150, sell \$25. Barr, 821-5870.
TV, RCA color, 19" screen with new wood stand; AM/FM Emerson stereo with speakers. Best offer. Otero, 255-4066.
HAM RADIO: Kenwood TS-520S transceiver 160-10m, \$425; microphone, \$20; electronic keyer, \$20. \$450 takes all. Denman, 883-5480.
SPEAKERS, Electrovoice, walnut, \$90; Sears airless spray gun, \$30; Big Band record set, played once, \$20; ladies' bicycle, \$35. Newton, 296-2335.
2 STORM DOORS, aluminum, 32x80, \$30 each. Hoff, 294-4835.
COMPUTER MODEM SYSTEM, complete, US Robotics, current versions: 300/1200 baud modem PASSWORD & communications software Telpac; list \$575, sell \$335; guaranteed. Stevens, 299-6086.
CAR STEREO, Alpine 7225, 16 w/ch, auto-reverse, \$175; Pioneer TS-168, 3-way, 6" round car speakers, \$25. Kurtz, 294-7646.
PUPPIES, 10 weeks, mother German shepherd/border collie cross, father Australian shepherd, \$15 each

(includes 1st shots). Sena, 873-1665.
HIDE-A-BED sofa, dbl-bed size, \$100; loveseat rocker, \$75; Hanksraft cool vapor humidifier, \$10; table lamp, \$10; prices negotiable. Andrick, 298-6917.
X-C SKIS, Trax no-wax, and poles, \$60; Ram fiberglass cap, fits late model, full-size Chev. pickups, \$375. Baehr, 898-7261 after 5:30.
WATERBED, king-size, bookcase headboard, 6-drawer dresser, padded side rails, heater, linens, complete, \$350; 36x80 storm door, \$15. Mozley, 268-7548.
SNOW TIRES, 2 E78-14 Bias tires on 5-hole GM rims, \$30 OBO. Davis, 293-1287.
'62 TV, b/w, 20" GE Model 426WWD, 27w x 18h x 15 1/2d, works, plus low stand with casters, \$30. Church, 898-5306.
PHOTO EQPT: Canon AE1 w/power winder, 28mm lens, 70-210mm Vivitar macro, 500mm Tokina, 1000mm Celestron telescope w/adaptor, 3500 Vivitar flash, 13 Cokin filters, cases, \$1200. Christopher, 256-7958 6-8 pm.
SEC'Y DESK, wooden, 30x65 w/extension 18x41, \$125. Sharp, 243-1498.
POCKETCOMPUTER, Radio Shack TRS-80 w/cassette interface, 24-character LCD display, new, \$60. Burstein, 821-6688.
COMFORTER, full size, dusty rose, reversible velour, \$35; 2 pillow shams, dusty rose, \$15. Foster, 299-6240.
ELECTRONIC PARTS & eqpt: Tektronic scope, \$75; regulated power supply, 18V60A12V6A6V52A, \$50; computer eqpt., printers, tape drives, more. Mayer, 294-3368.

TRANSPORTATION

'82 FJ650 Yamaha Turbo custom, full fairing, shaft drive, oil cooler, HP kit, pay off takes it, \$2584. Romero, 465-2923.
HOT ROD, '26 bucket, Ford, 350 Chevy, 350 turbo, discs, spokes, w/top, bright yellow, lots of chrome, \$9500. Ortega, 296-4714.
'79 PONTIAC Firebird, stereo, new

tires, below book value, \$3800 OBO. Gallegos, 345-7147, 344-3290.
'83 CAMARO Z28, loaded, T-tops, extended warranty, make reasonable offer. Delnick, 298-5276.
18 1/2' MOTOR HOME, '76 Mobile Traveler/Dodge, low miles, \$10K negotiable, single rear wheels. Schultz, 881-8062.
'73 FORD F-100 pickup, 360 ci V8, extras, Troncoso, 897-1167.
'75 TRIUMPH TR7, needs work on trans. & elec. system, \$500 OBO. Worden, 881-4486.
'74 MERCEDES 250, approx. 95K miles, PS, PB, AM/FM/cass, new paint, \$5500 firm. Brunacini, 268-7299.
'73 VW super beetle, rebuilt engine, new radials, one owner, \$2200. Williams, 293-4115.
'64 VW bug, needs work, book value \$1400-2400, sell for \$500. Edmonds, 884-5974.
'81 CAMARO, 27K miles, 3-spd., std., 20+ mpg in town, \$5750 OBO. Kefauver, 821-1944.
'81 HONDA Goldwing, Hondaline fairing, CB, AM/FM/cass., Samsonite luggage, 23K miles, \$2600. Brooks, 296-6870.
'79 CORVETTE L-82, T-tops, AC, PW, PL, factory alum. wheels, new tires, 39K miles, \$11,200. Ashment, 293-2295.
'79 BUICK Skyhawk hatchback, 47K, AT, AC, PS, PB, new tires, stereo 8 track, AM/FM, \$2200. Williams, 1-864-3617.
'67 MUSTANG 302 V8, AT, new paint-brakes-wheel bearings, \$2000. Welch, 266-2074.
NISSAN Patrol, 4-wd brute, new tires, head job, upholstery, brakes, 59K miles, rarely off road, \$2350. Second owner, King 821-2953.
'81 HONDA CX500D, shaft drive, water cooled, low mileage, many extras, \$1400 OBO. Zirzow, 294-7296.
'82 CADILLAC Fleetwood Brougham de Elegance, all power, leather seats, AM/FM/cass., wire wheel covers, 15K miles. Alexander, 884-4930.
'83 VW Vanagon camper, water cooled, AC, stove, refrig., sink, pop-up, sleeps 4, \$13K. Dubay, 821-4648.

REAL ESTATE

2-BDR., 1 bath, 2-car garage, Rio Rancho, 1000 sq. ft., drapes, refrig., washer & dryer, \$46,500. Serrano, 892-7905 after 5.
HOUSE in Las Cruces, 3-bdr., 2000 sq. ft., residential neighborhood, Mancini 266-1376, 1-526-5603.
PARTIAL passive solar, new 1450 sq. ft., 3-bdr., 2 bath, study, great room, carpeted, stove, dishwasher, wood or coal burning stove, 200' well, 2 1/2 acres, Moriarty, \$58,650. Breckenridge, 1-832-4215.
DOUBLE wide MH, 24'x63', corner space Wyoming Plaza, 500 Wyoming SE, #65. Hartenberger, 294-7822.
TOWNHOUSE, 1330 sq. ft., 2-bdr., 2 baths, dbl. garage, energy efficient, many extras, appraisal \$85K. Newton, 296-2335.
'84 CAMEO MH, 14x72, 2-bdr., 2 bath, pitched shingled roof, wood siding, solid oak cabinets, \$2K, assume loan. Eaton, 869-2847.
HERITAGE Hills, 3-bdr., 1 1/2 bath, LR, DR, den, custom drapes, more, \$97,500 or \$30K CTL. Martinez, 821-8692.
FLEETWOOD MH, 14x80, 3-bdr., 2 baths, all appliances, carpeted, set up w/enclosed rear porch & carport, storage shed. Morton, 296-6108.

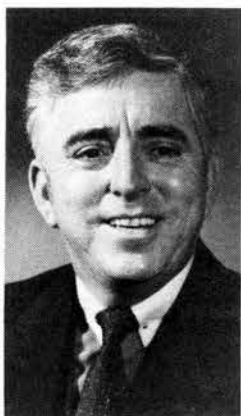
WANTED

SOFA BED, med. firmness, prefer queen size but will consider double. Aeschliman, 281-1227.
SOFTBALL players needed to complete roster for men's Sandia competitive league; practice begins late Feb. or early March. Sparks, 299-2789.
LATE model Rolleiflex camera. Smith, 243-0714.
ELECTRIC trains, "N" gauge, trains, track, accessories. Stuart, 299-9190.

LOST

IN Tech Area 1: Sunglasses, Ray-ban Aviator, black metal frames. Kessel, 266-2094.
CONTACT lenses in orange & white tubular container, if found please call 298-8226.

Sal Salas New Club Manager



SAL SALAS is the new manager of the Coronado Club, appointed by the board of directors at a recent meeting. He replaces Mitch Griffin who resigned.

Sal joined the Coronado Club staff as night manager last June, the same month he retired from the Air Force. Sal spent 23 years in the service, 15 of those years working in service club operations. He was manager of officers and enlisted clubs in Okinawa, Utah, and New Jersey.

Since taking over Club operations, Sal has concentrated on luncheon service ("We offer the best selection on Base") and weekend activities ("We're full on Friday nights — reservations are necessary"). He plans new Saturday events ("Combine the old Gourmet Club 35 with a new Saturday Supper Club in the El Dorado room with easy-listening entertainment, easy dancing music"). He's also worked with the new retiree interest group, the Thunderbirds.

"We have more than 2700 members now," Sal says, "and we hope to expand activities to offer something exciting for everyone."

TONIGHT the Club's dining room features New York steak at \$7.50 with the popular Isleta Poor Boys playing their brand of country western music. Call the Club office, 265-6791, *right now* to find out about reservations.

TOMORROW at Variety Night, the movie is a Walt Disney film featuring live actors and animation. It's called *Pete's Dragon*, and the story line is about a youngster who may or may not have a pet dragon. It's good family fun in the Disney tradition. Food service starts at 5 p.m.; the movie at 6. Admission is free to members and families.

ON MONDAY, Feb. 4, the first of two special travel programs is scheduled at 7:30 p.m. in the ballroom. This one will provide you with information about planning your own trip to Europe. Speakers are from Rio Grande Travel Center. Coming up on Monday, Feb. 25, is a program on Alaska and Alaskan cruises to be presented by Pajarito Travel.

In the meantime, consider signing up for a one-day Club chartered bus trip to Chaco Canyon on Saturday, April 20. Marv Plugge (5171) and the Club's travel committee have arranged for a tour guide from the Chaco Center at UNM. The bus will leave the Club at 6:30 a.m. and return about 8 p.m. Refreshments will be served on the bus; bring your own picnic lunch. Cost is \$26 per person. Sign up right away at the Club office.

The Travel committee mans a travel table in the Club lobby on Friday evenings with literature on a number of currently available commercial tours. The committee is also interested in learning where Club members would like to go and the kind of

trips that have appeal. Stop by and talk travel.

NEXT FRIDAY, Feb. 8, sirloin steak at \$6.50 is the dining room special while Together, a swinging variety group, is booked to make the dancing music. Scheduled on Friday, Feb. 15, is a Valentine special — two-for-one filet mignon for \$12.95. Paul Metoyer (3435) and his Enchantment group will contribute some romantic music for the occasion. Singer/guitarist Robin Arquette entertains in the main lounge.

CORONADO SKI CLUB'S monthly meeting is set for Tuesday, Feb. 19, at 7 p.m. Program speaker is Harry Baxter who has the word on skiing at Jackson Hole. The standard Ski Club prices and door prizes are part of the event.

The Ski Club bus trip to Utah Feb. 23-27 has a few seats left; call Ted Reed (2543) on 4-3981 to sign up. Also scheduled are trips to Lake Tahoe March 10-17 (call Fred Schkade, 2614, on 4-7462) and a trip to Jackson Hole March 23-30 (call Joel Miller, 1523, on 4-1775.)

RETIREEES have now organized their own Coronado Club special interest group, called the Thunderbirds, and elected Nick DeLollis president. A card party is planned in the El Dorado room on Monday, Feb. 11. Chairman Jim McCutcheon says bring your own cards — there'll be party bridge, canasta, pinochle, or whatever — and be there around 10:30 a.m. Plan to have lunch at the Club, and then play all afternoon.

A dinner dance is scheduled Saturday, Feb. 27, with the big 11-piece band of Don Lesman booked for the event. Lesman plays the old songs, big band style, with recognizable words and melodies. LAB NEWS talked with Lesman and can report that he's enthusiastic about the occasion. "Big band music never died," he says. "It's alive and well and better than ever. How long has it been since you've heard a Tommy Dorsey-type trombone? We'll play arrangements that sound like Artie Shaw, the Dorsey brothers, Glen Miller, and Harry James. Our band loves an audience, loves to play good music."

Dinner will be a super buffet topped by carved steamboat round of roast beef. Cost is \$7. All Sandia and DOE retirees are invited. Call the Club office, 265-6791, for reservations.

1985 Holidays

Memorial Day Mon., May 27
Independence Day .. Thurs., July 4
Labor Day Mon., Sept. 2
Thanksgiving Thurs., Nov. 28
Energy Conservation Day
..... Fri., Nov. 29
Christmas and New Year Shutdown
Wed., Dec. 25 through Wed., Jan. 1

KAFB Puts Teeth In Seat Belt Rule

KAFB military security forces are now enforcing a new "get tough" policy on Base drivers and passengers who don't use seat belts. A mandatory rule for vehicle operators on base, the "you will buckle up" directive has — until now — resulted in citations only as an adjunct to some other traffic violation.

No longer. As of today, the Security Police who man the gates will conduct random inspections during non-peak traffic hours and issue citations to those not wearing seat belts.

For military people, the crackdown works this way: first offenders will be counseled. Second offenders will be counseled again and will have to take a driver improvement class and see the seat belt safety film, "Room to Live." Three-time losers will see their driving privileges on Base restricted for 30 days, and fourth offenders won't be allowed to drive on Base for six months.

Jerry Jercinovic, Sandia's safety manager (3440), reports that Sandians who are cited for not buckling up will be counseled by their supervisor for their first two citations. Further steps for additional offenses will parallel the military policy.

"Seat belts save lives," Jerry says. "Sandia is cooperating with Base officials in this seat belt campaign because the use of seat belts is a condition of driving on the Base and because we believe the statistics. In 1983, 293 people died in vehicle accidents in New Mexico. It's estimated that 213 of those lives may have been saved if all persons involved had been wearing seat belts."

"For most Sandians who buckle up as a matter of course, this crackdown will present no problem," Jerry continues. "We know that seat belts not only save lives but also reduce the severity of injuries suffered in vehicle accidents."

Jerry reminds employees that DOE also has a mandatory seat belt rule for all occupants of government vehicles.

Fun and Games

Square Dancing — Beginners square dancing lessons (free for first 16 weeks,) offered by the Levis and Lace Square Dance Club, begin Feb. 4 from 7-8:30 p.m. at Moose Lodge, 2121 Edith Blvd. NE. For more information, call 293-4360 or 897-3246.

Boating Safety — Free classes in boat handling and safety for both power and sailing crafts will be offered by the U.S. Coast Guard Auxiliary. The 13 weeks of classes begin Feb. 6 at 7 p.m. at the Armed Forces Reserve Center, 400 Wyoming NE, room 212. A small fee for text and supplies will be charged. For more information, call Carl Boxx (Ret.), 299-2855, or 298-5926.

Congratulations

Andy (3521) and Carolyn Diaz, a son, Tomas, Jan. 8.

Mary Fallon (3523) and Milt Zimmerman (5242), married in Albuquerque, Jan. 19.